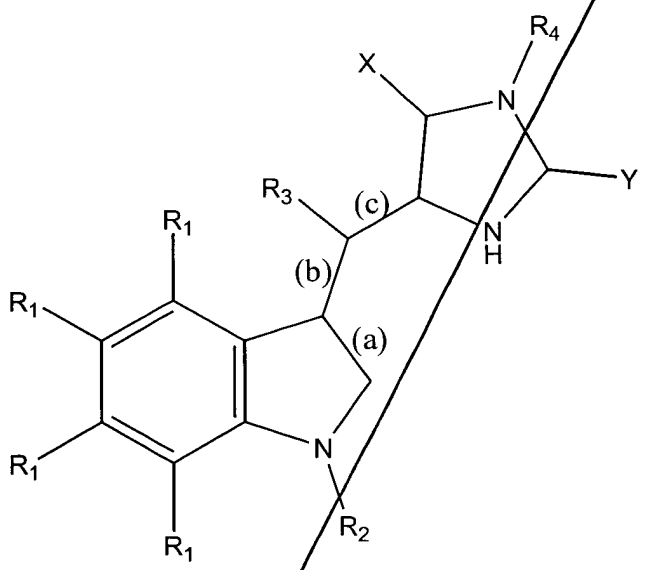
1. A chemical compound in a pharmaceutically acceptable carrier, said compound having the formula:



wherein

each R_1 is independently selected from the group consisting of hydrogen, methyl, carboxy, hydroxyl, methoxyl, amino, and nitro;

R_2 is selected from the group consisting of hydrogen, alkyl, and acyl;

R_3 is selected from the group consisting of alkyl, acyl, halogen, hydrogen, or hydroxyl;

R_4 is selected from the group consisting of methyl, hydroxyl, carboxyl, and linear and branching alkyl groups;

X is selected from the group consisting of =O, -OH and -H;

Y is selected from the group consisting of =S and $-SR_5$, where R_5 is either hydrogen or an alkyl group; and

each of the bonds (a), (b), and (c) independently is either a double or

single bond, provided, however, that bond (a) and bond (b) are not both double bonds.

2. The compound of claim 1, wherein

each R_1 is hydrogen;

R_2 and R_3 are each hydrogen;

R_4 is a methyl group;

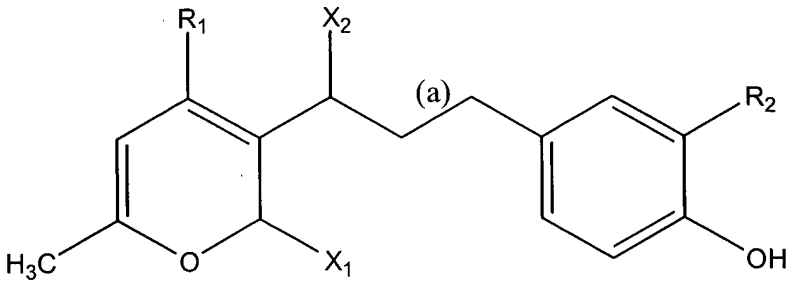
X is =O;

Y is =S;

bond (a) is a double bond, and

bonds (b) and (c) are each single bonds.

3. A compound in a pharmaceutically acceptable carrier, said compound having the formula:



wherein

each of X_1 and X_2 is independently selected from the group consisting of =O,

-OH and -H;

R_1 is selected from the group consisting of hydrogen and a hydroxyl;

R_2 is selected from the group consisting of hydrogen, sulfate, nitro, and halide; and

the bond (a) is either a single or double bond.

4. The compound of claim 3, wherein

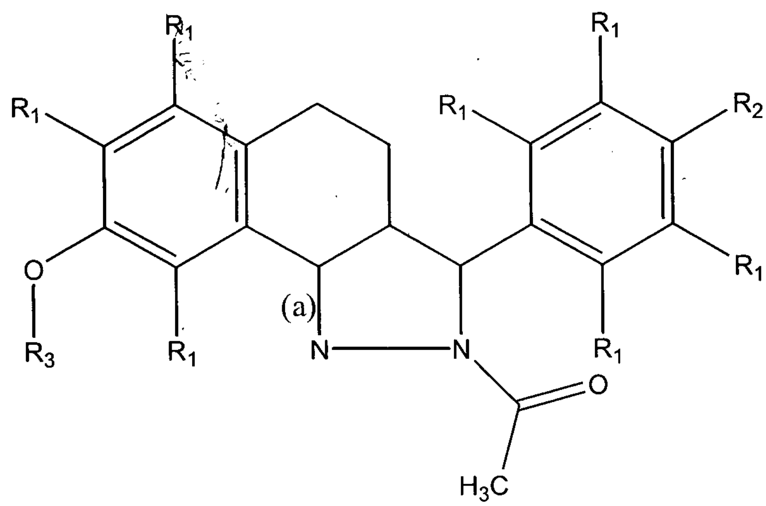
each of X_1 and X_2 is =O;

R_1 is a hydroxyl group;

R_2 is a nitro group; and

the bond (a) is a double bond.

5. A chemical compound in a pharmaceutically acceptable carrier, said compound having the formula:



wherein

each R_1 is independently selected from the group consisting of hydrogen, amino, halide, and hydroxyl;

R_2 is selected from the group consisting of hydrogen, halide, and hydroxyl;

R_3 is selected from the group consisting of hydrogen and methyl; and

the bond (a) is either a single or double bond.

6. The compound of claim 5, wherein

each R_1 is hydrogen;

R_2 is fluorine;

R_3 is a methyl group; and

the bond (a) is a double bond.

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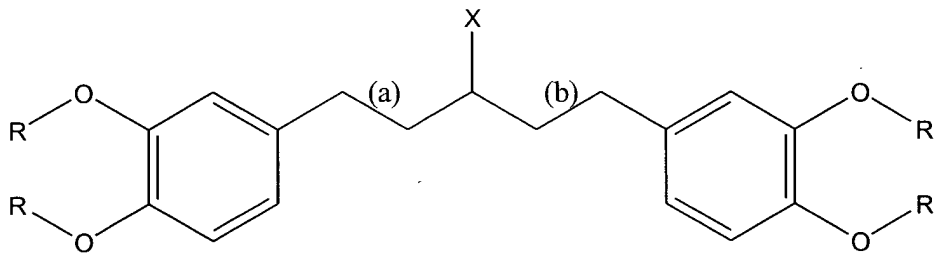
7. A chemical compound in a pharmaceutically acceptable carrier, said compound having the formula:



wherein

each R is independently selected from the group consisting of H or CH_3;

the bond (a) is either a single or double bond;

the bond (b) is either a single or double bond; and

X is selected from the group consisting of =O, -OH and -H.

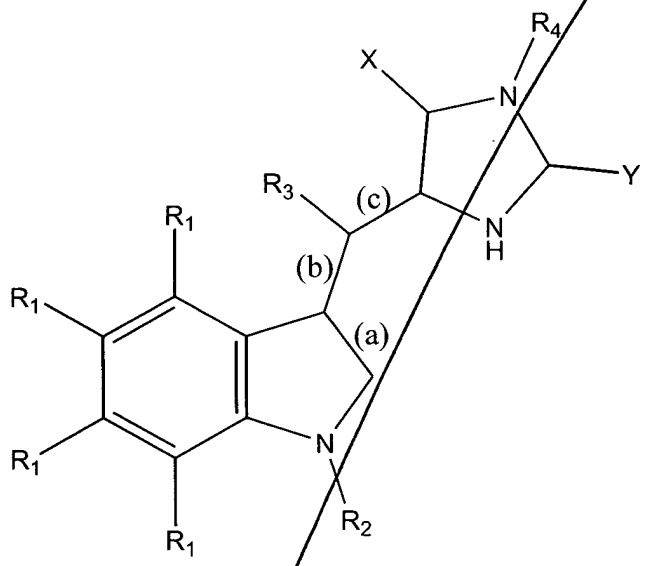
8. The compound of claim 7, wherein

each R is CH_3;

the (a) and (b) bonds are each a double bond; and

X is =O.

9. A method for decreasing necrosis, said method comprising contacting a cell with a chemical compound, said compound having the formula:



wherein

each R_1 is independently selected from the group consisting of hydrogen, methyl, carboxy, hydroxyl, methoxyl, amino, and nitro;

R_2 is selected from the group consisting of hydrogen, alkyl, and acyl;

R_3 is selected from the group consisting of alkyl, acyl, halogen, hydrogen, or hydroxyl;

R_4 is selected from the group consisting of methyl, hydroxyl, carboxyl, and linear and branching alkyl groups;

X is selected from the group consisting of =O, -OH and -H;

Y is selected from the group consisting of =S and $-SR_5$, where R_5 is either hydrogen or an alkyl group; and

each of the bonds (a), (b), and (c) independently is either a double or

single bond, provided, however, that bond (a) and bond (b) are not both double bonds.

10. The method of claim 9, wherein in said compound

each R_1 is hydrogen;

R_2 and R_3 are each hydrogen;

R_4 is a methyl group;

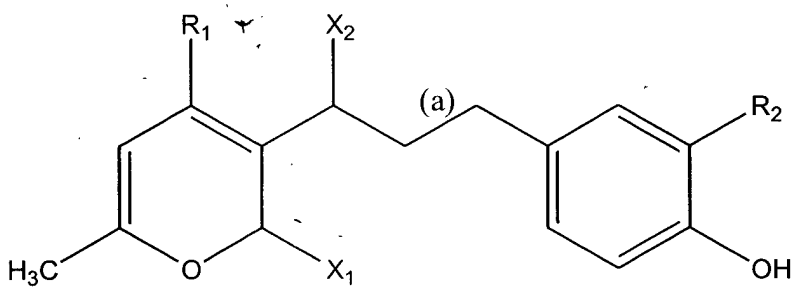
X is =O;

Y is =S;

bond (a) is a double bond; and

bonds (b) and (c) are each single bonds.

11. A method for decreasing necrosis, said method comprising contacting a cell with a chemical compound having the formula:



wherein

each of X_1 and X_2 is independently selected from the group consisting of =O,

-OH and -H;

R_1 is selected from the group consisting of hydrogen and a hydroxyl;

R_2 is selected from the group consisting of hydrogen, sulfate, nitro, and halide; and

the bond (a) is either a single or double bond.

12. The method of claim 11, wherein in said compound,

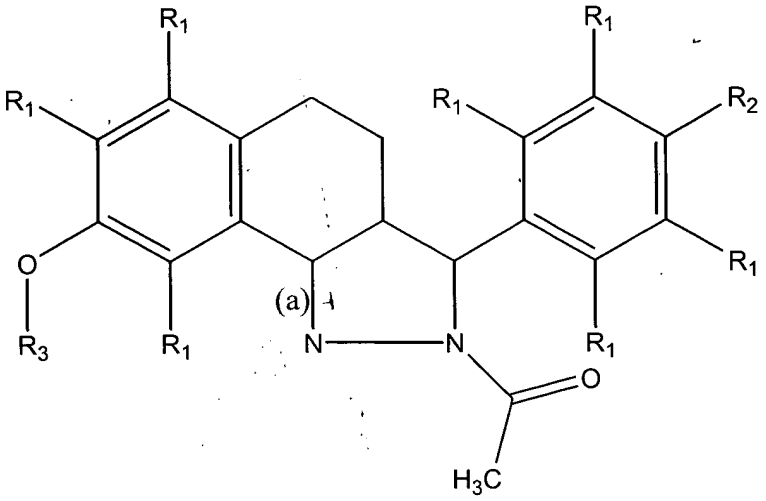
each of X_1 and X_2 is =O;

R_1 is a hydroxyl group;

R_2 is a nitro group; and

the bond (a) is a double bond.

13. A method for decreasing necrosis, said method comprising contacting a cell with a chemical compound having the formula:



wherein

each R_1 is independently selected from the group consisting of hydrogen, amino, halide, and hydroxyl;

R_2 is selected from the group consisting of hydrogen, halide, and hydroxyl;

R_3 is selected from the group consisting of hydrogen and methyl; and

the bond (a) is either a single or double bond.

14. The method of claim 13, wherein in said compound

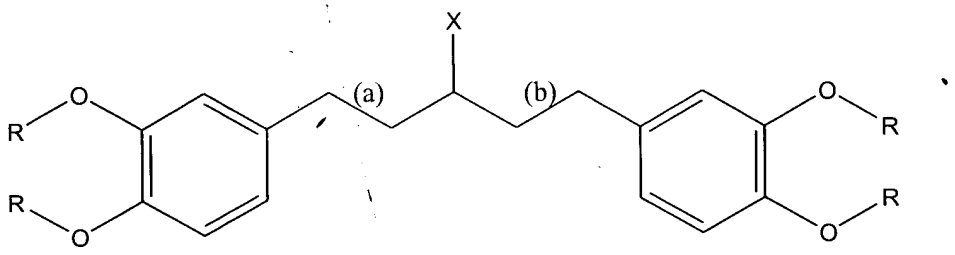
each R_1 is hydrogen;

R_2 is fluorine;

R_3 is a methyl group; and

the bond (a) is a double bond.

15. A method for decreasing necrosis, said method comprising contacting a cell with a chemical compound having the formula:



wherein

each R is independently selected from the group consisting of H or CH_3;

the bond (a) is either a single or double bond;

the bond (b) is either a single or double bond; and

X is selected from the group consisting of =O, -OH and -H.

16. The method of claim 15, wherein in said compound

each R is CH_3;

the (a) and (b) bonds are each a double bond; and

X is =O.

17. The method of any of claims 9, 11, 13, or 15, wherein said cell is capable of undergoing necrosis in the presence of zVAD-fmk and TNFα.

18. The method of any of claims 9, 11, 13, or 15, wherein said cell is capable of undergoing necrosis in the presence of zVAD-fmk and DMSO.

19. The method of any of claims 9, 11, 13, or 15, wherein said cell is mammalian.

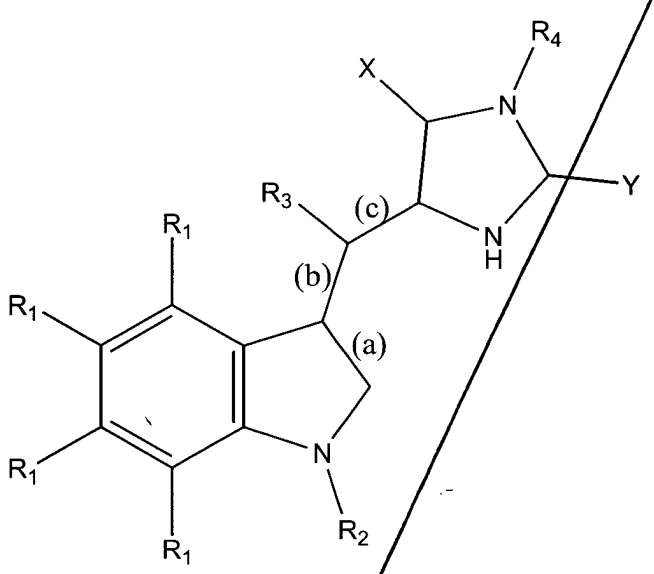
8 7
~~20.~~ The method of claim ~~19~~, wherein said cell is human.

9 7
~~21.~~ The method of claim ~~19~~, wherein said cell is a neuron.

10 7
~~22.~~ The method of claim ~~19~~, wherein said cell is a rodent cell.

23. The method of any of claims 9, 11, 13, or 15, wherein said compound is in a pharmaceutically acceptable carrier.

24. A method for treating a condition in a subject, said method comprising the steps of administering a chemical compound having the formula:



to said subject, in a dosage sufficient to decrease necrosis, wherein

each R_1 is independently selected from the group consisting of hydrogen, methyl, carboxy, hydroxyl, methoxyl, amino, and nitro;

R_2 is selected from the group consisting of hydrogen, alkyl, and acyl;

R_3 is selected from the group consisting of alkyl, acyl, halogen, hydrogen, or hydroxyl;

R_4 is selected from the group consisting of methyl, hydroxyl, carboxyl, and linear and branching alkyl groups;

X is selected from the group consisting of =O, -OH and -H;

Y is selected from the group consisting of =S and $-SR_5$, where R_5 is either hydrogen or an alkyl group; and

each of the bonds (a), (b), and (c) independently is either a double or single bond, provided, however, that bond (a) and bond (b) are not both double bonds.

25. The method of claim 24, wherein in said compound

each R_1 is hydrogen;

R_2 and R_3 are each hydrogen;

R_4 is a methyl group;

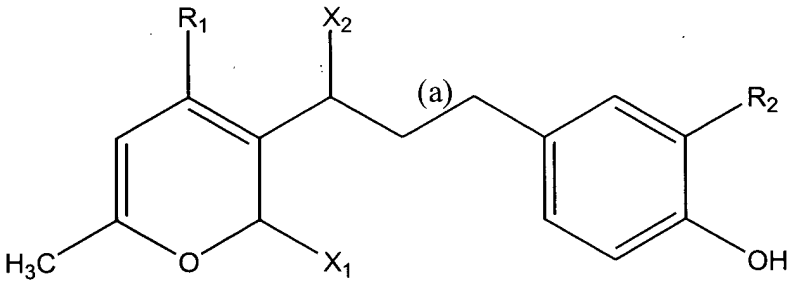
X is =O;

Y is =S;

bond (a) is a double bond; and

bonds (b) and (c) are each single bonds.

26. A method for treating a condition in a subject, said method comprising the steps of administering a chemical compound having the formula:



to said subject, in a dosage sufficient to decrease necrosis wherein

each of X_1 and X_2 is independently selected from the group consisting of =O,

-OH and -H;

R_1 is selected from the group consisting of hydrogen and a hydroxyl;

R_2 is selected from the group consisting of hydrogen, sulfate, nitro, and halide; and

the bond (a) is either a single or double bond.

27. The method of claim 26, wherein in said compound

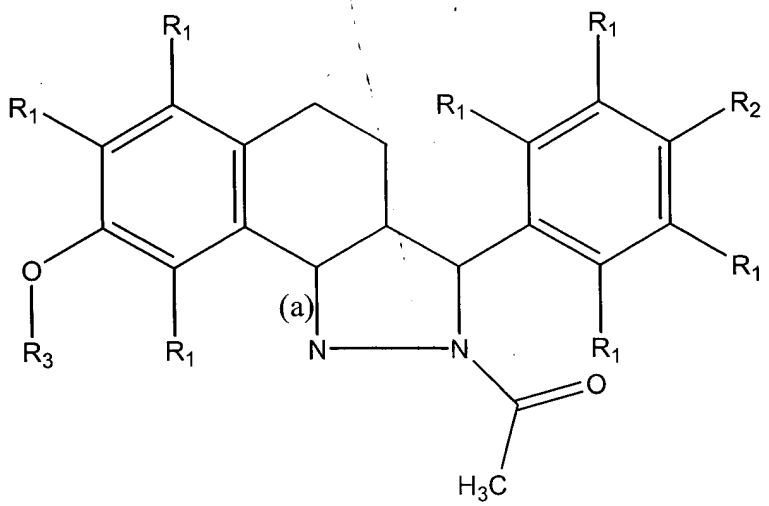
each of X_1 and X_2 is =O;

R_1 is a hydroxyl group;

R_2 is a nitro group; and

the bond (a) is a double bond.

28. A method for treating a condition in a subject, said method comprising the steps of administering a chemical compound having the formula:



to said subject, in a dosage sufficient to decrease necrosis wherein

each R_1 is independently selected from the group consisting of hydrogen, amino, halide, and hydroxyl;

R_2 is selected from the group consisting of hydrogen, halide, and hydroxyl;

R_3 is selected from the group consisting of hydrogen and methyl; and

the bond (a) is either a single or double bond.

29. The compound of claim 28, wherein in said compound

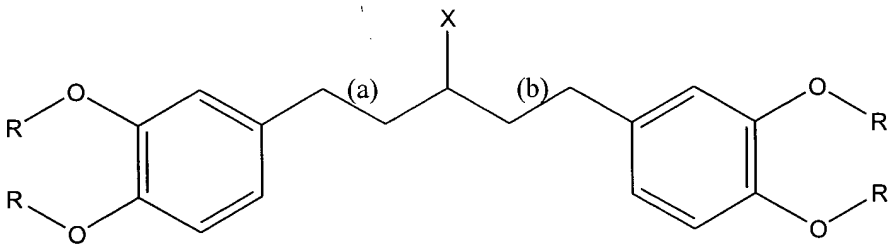
each R_1 is hydrogen;

R_2 is fluorine;

R_3 is a methyl group; and

the bond (a) is a double bond.

30. A method for treating a condition in a subject, said method comprising the steps of administering a chemical compound having the formula:



to said subject, in a dosage sufficient to decrease necrosis wherein

each R is independently selected from the group consisting of H or CH_3;

the bond (a) is either a single or double bond;

the bond (b) is either a single or double bond; and

X is selected from the group consisting of =O, -OH and -H.

31. The compound of claim 30, wherein in said compound

each R is CH_3;

the (a) and (b) bonds are each a double bond; and

X is =O.

32. The method of any of claims 24, 26, 28, or 30, wherein said condition is a neurodegenerative disease.

33. The method of claim 32, wherein said neurodegenerative disease is selected from the group consisting of Alzheimer's disease, Huntington's disease,

cerebral ischemia, stroke, amyotropic lateral sclerosis, multiple sclerosis, Lewy body disease, Menkes, disease, Wilson disease, Creutzfeldt-Jakob disease, and Fahr disease.

34. The method of any of claims 24, 26, 28, or 30, wherein said condition is selected from the group consisting of ischemic brain injury, ischemic heart injury, and head trauma.

35. The method of any of claims 24, 26, 28, or 30, wherein said subject is a mammal.

36. The method of claim ~~35~~ 17, wherein said subject is a human.

37. The method of claim ~~35~~ 17, wherein said subject is a rodent.

38. A method for identifying a compound that decreases necrosis, comprising the steps of :

(a) providing a cell in which apoptosis is prevented;

(b) contacting said cell with a first compound that causes a cell to undergo necrosis;

(c) contacting said cell with a second compound; and

(d) measuring necrosis relative to a control cell,

wherein a decrease in necrosis indicates that said second compound decreases necrosis.

39. The method of claim 38, wherein said apoptosis is prevented by contacting said cell with zVAD-fmk.

40. The method of claim 38, wherein said first compound is TNFα or DMSO.